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During the transition to the new format, authors may continue to submit manuscripts in the present format, described under *Requirements* on this page, or may prepare manuscripts in the new format. Complete instructions for the new format are available from the editorial offices at the address listed below under *Correspondence*.

Features. Under the present format, the *Journal of Medical Education* considers four types of papers from contributors: major articles, communications, briefs, and letters to the editor. *Major articles* include reflective, perspective writings and fully documented reports on major studies involving and affecting medical education. *Communications* and *briefs* are for presentations of new ideas on medical education, preliminary findings of projects, and reports on limited studies.

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Each table, diagram, figure, and photograph should have a legend and should be understandable independent of the text. Each table should be typed on a separate sheet. Simple tables should be written into text in narrative form. Vertical rules are not used in tables; only straddle horizontal rules joining two or more columns are permissible. All illustrations must be professionally drawn and lettered, and the lettering should be in a type large enough that it will be legible when the illustration is reduced to fit a *Journal* page. Either the original artwork or a good, high-contrast photograph of the artwork should be submitted. Identify each figure by number.

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Authors should study a few recent issues of the *Journal* for additional guidelines on style and format. Special requirements apply to supplements, and the editor should be queried before lengthy material is submitted.

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Journal of Medical Education

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Teaching and Policies on Substance Abuse

Substance Abuse Units Taught by Four Specialties in Medical Schools and Residency Programs—Ardis K. Davis, Frances Cotter, and Dorynne Czechowicz 739

Substance Use by Fourth-Year Students at 13 U.S. Medical Schools—Scott Conard, Patrick Hughes, DeWitt C. Baldwin, Jr., Karl E. Achenbach, and David V. Sheehan 747

Substance Abuse Policies and Programs at U.S. Medical Schools (Datagram)—Beverly Davies Rowley and DeWitt C. Baldwin, Jr. 759

Survey on Curriculum Committees at U.S. and Canadian Medical Schools—William D. Hendricson, Michael S. Katz, and Leslie J. Hoy 762

Study of Relation of Continuing Medical Education to Quality of Family Physicians' Care—Earl V. Dunn, Martin J. Bass, J. Ivan Williams, Alex E. W. Borgiel, Peter MacDonald, and Robert A. Spasoff 775

A Literature Review on the Efficacy of Video in Patient Education—Martha E. Gagliano 785

Communications: Seminars, Clinics, and Laboratories on Medical Ignorance—Marlys H. Witte, Ann Kerwin, and Charles L. Witte 793

Using an Interdisciplinary Team for Geriatric Education in a Nursing Home—Robert F. Thompson, Robert L. Rhyne, Mark A. Stratton, and Ruth H. Franklin 796

Family Practice Residents' Documentation of Clinical Skills—Neil J. Murphy and Craig McClure 798

Teaching Communication and Interviewing Skills to Medical Students Preparing for Residency Interviews—Martha G. Regan-Smith, Allen J. Dietrich, Ardis L. Olson, Maggie Moore-West, and Paul A. Argenti 801

Briefs 804

Editorial: Scientific Fraud 806

Letter to the Editor 809

Book Reviews 810

Bibliography 814

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Substance Abuse Units Taught by Four Specialties In Medical Schools and Residency Programs

Ardis K. Davis, Frances Cotter, and Dorynne Czechowicz, M. D.

Abstract—Four medical specialty organizations conducted a survey of 294 departments in 98 medical schools and 1,124 residency programs to identify the number and type of curriculum units on substance abuse offered by these specialties. A curriculum unit was defined as a formal block of teaching on substance abuse. A total of 251 (85 percent) of the medical school departments and 828 (74 percent) of the residency programs responded. Of those, 175 (70 percent) of the medical school departments and 479 (58 percent) of the residency programs reported offering at least one curriculum unit on substance abuse. There was considerable variation among the four specialties in the number and percentage of departments or programs reporting such units. Overall, a majority of the units addressed both alcohol and other drugs, were required, and included a clinical component. Evaluations of content and teaching strategies are needed to examine the quality and adequacy of substance abuse training.

Concern about the use and abuse of alcohol and other drugs in the United States is not new, but during the past decade there has been an increasing awareness of the medical profession's influence in the prevention and treatment of substance abuse. For this reason, medical educators have placed a growing emphasis on substance abuse training in medical education.

Institutional barriers have long been cited as the primary reason that substance abuse is not universally included in medical school curricula (1). Attempts were made in the 1970s to overcome such barriers through the federally sponsored Career Teacher Program (2). A national survey of drug-abuse and alcoholism teaching in medical and osteopathic schools (3) and a subsequent follow-up study of a sample of those schools (4) concluded that although improvements had occurred there remained a need for additional substance abuse training in medical education.

Kamerow and colleagues (5) reported in 1986 that the level of training did not match the magnitude of the substance

This report is based on survey data collected by four medical specialty organizations under contracts supported by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Institute on Drug Abuse (NIDA).

Ms. Davis is an independent medical educator in substance abuse in Seattle, Washington, and is project coordinator, Substance Abuse Faculty Development Program of the Society of Teachers of Family Medicine, Kansas City, Missouri; Ms. Cotter is coordinator, Health Professions Education Program in the Division of Clinical and Prevention Research of the NIAAA; and Dr. Czechowicz is associate director for medical and professional affairs in the Office of Science of the NIDA.

abuse problem, and Hanlon (6) reported that a relevant clinical experience is required in substance abuse training. In addition, there is growing interest in increased substance abuse training for the clinical medical specialties (7). As recently as 1986, Moore and Malitz (8) reported that residents in ambulatory care settings underdiagnose alcoholism and that there is a corresponding need to improve training of physicians in ambulatory practice settings (8). This potential for alcoholism screening in ambulatory practice is receiving increasing attention, as documented recently (9). Prevention and early diagnosis and intervention in substance abuse, thus, have a logical place in specialty training programs, but implementing such curricula remains difficult (10).

To determine future directions for substance abuse training in medical education, however, medical educators need answers to two questions: To what extent is substance abuse formally taught to medical students and residents in clinical medical specialties? How is it being taught?

In 1986 the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the National Institute on Drug Abuse (NIDA) financed studies that would describe alcohol and other drug abuse training in medical education in the United States. Four medical specialty organizations contracted with the institutes to conduct these studies for their respective specialties: the Society for Research and Education in Primary Care Internal Medicine, now the Society of General Internal Medicine), the Society of Teachers of Family Medicine, the Ambulatory Pediatric Association, and the American Psychiatric Association. These specialty groups worked together on a survey of each of their training programs for both medical students and residents. The findings from this survey form the basis of this report.

Methods

In February and March 1986, each of the four specialty organizations mailed a survey questionnaire to the directors of accredited residency training programs and the chairpersons of medical school departments in its specialty throughout the United States and Puerto Rico. There were some variations among the specialties in their initial contact and follow-up methods, the most notable being that the pediatrics society included a supplemental set of survey questions as part of their initial mailing. Follow-up procedures included mailing a follow-up questionnaire (used by family medicine and psychiatry) and telephone follow-up during which additional survey data were collected (used by internal medicine). In addition, the psychiatry and family medicine societies conducted telephone sampling of nonrespondents. All contacts by the specialty organizations were completed by July 31, 1986.

The survey instrument was designed jointly by representatives from each specialty and, with minor variations reflecting specialty-specific interests, was accepted for use by all four specialties. The survey requested information on the content and teaching approaches for each curriculum unit on substance abuse in a given residency program or medical school department. A curriculum unit (CU) was defined as any formal block of teaching on substance abuse. This definition allowed a CU to include instructional approaches ranging from a single lecture to a seminar, teaching module, clerkship, or clinical rotation. Such a definition was chosen in an attempt to in-

clude the broadest possible range of instruction on substance abuse.

Recipients were asked in an explanatory cover letter to forward the survey instrument to their faculty members responsible for teaching substance abuse. In the internal medicine medical school survey, the instrument was to be forwarded to faculty members responsible for the physical diagnosis and core clerkship courses and to any other faculty members who taught independent, selective, or elective courses on substance abuse. For all specialties, if no substance abuse units existed, recipients were asked to so indicate and return the form in the envelope provided.

In addition to the surveys by the four specialties, the American Medical Student Association conducted a simultaneous survey using the same questionnaire but directed at medical school curriculum deans.

The survey data were coded, entered in computer files, and analyzed separately by each medical specialty, after which the data from the four specialties' residency programs were merged into one data base for analysis. The medical school data were managed differently. A total of 133 medical schools and branch campuses were contacted by one or more of the four specialties. Because of a low response rate from pediatric departments and the corresponding uncertainty about the degree to which such responses were representative of pediatric programs nationally, only analyses of data from the other three specialties were considered. In order to facilitate comparisons of curriculum units across specialties within medical schools, only data from those institutions contacted by all three specialties were used in the analyses and results reported here. Preliminary analyses revealed that the overall differences in the characteristics of the curriculum units from this subset of schools and those from the larger group of 133 schools (including the pediatric data) were minimal.

Results

A total of 294 medical school departments in 98 medical schools were contacted by the specialty organizations representing family medicine, internal medicine, and psychiatry. A total of 1,124 residency programs were contacted by the family medicine (381), internal medicine (291), pediatrics (232), and psychiatry (220) organizations.

Eighty-five percent (251) of the medical school departments and 74 percent (828) of the residency programs responded. The response rates for the medical school departments were 91 percent for internal medicine, 86 percent for psychiatry, and 80 percent for family medicine. Two schools did not respond to any of the three specialties, and six reported no curriculum units, leaving 90 schools reporting one or more CUs. Of these 90 schools, 28 reported CUs from one specialty only, 39 from two specialties, and 23 from all three specialties. For the residency programs, the response rates were: internal medicine, 80 percent; psychiatry, 77 percent; family medicine, 76 percent; and pediatrics 60 percent.

The specialties varied considerably in the number and percentage of residency programs and medical school departments reporting CUs, as shown in Table 1. The survey identified and described 308 medical school CUs and 605 residency CUs in substance abuse.

RESIDENCY PROGRAMS

Over half (62 percent) of the CUs reported by residency programs were part of larger courses or clinical rotations (49

TABLE 1

Numbers and Percentages of U.S. Medical Schools and Residency Programs That Reported Offering a Curriculum Unit on Substance Abuse in Each of Four Specialties, 1986*

Departments/Programs	No. of Respondents	Respondents Reporting Units on Substance Abuse	
		No.	Percent
Medical School Departments†			
Family medicine	78	52	67
Internal medicine	89	41	46
Psychiatry	84	82	98
Total	251	175	70
Residency Programs			
Family medicine	288	195	68
Internal medicine	232	93	40
Pediatrics	139	38	27
Psychiatry	169	153	91
Total	828	479	58

* Survey questionnaires were designed jointly by four specialty organizations and administered separately by those organizations. See text for details on these organizations, the questionnaires, and the definition of curriculum unit. A total of 294 departments in 98 medical schools and 1,124 residency programs were contacted.

† Because of the low response rate from pediatrics departments, pediatrics data were not analyzed or reported.

percent, psychiatry; 63 percent, family medicine; 71 percent, pediatrics; 81 percent, internal medicine). The remaining CUs were entire rotations or independent courses on substance abuse. The majority of all CUs were required (86 percent) and offered yearly (89 percent). A large proportion (84 percent) contained training in both alcohol and other drugs, although this combination was less often the case in internal medicine. Over half of the pediatric CUs addressed tobacco addiction, whereas approximately one-quarter to one-third of the CUs in the other three specialties did so.

A majority (72 percent) of the curriculum units included clinical experiences. The family medicine CUs included such a clinical component most frequently (84 percent), followed by psychiatry (72 percent), pediatrics (65 percent), and internal medicine (53 percent). General medical settings and substance abuse treatment settings were often combined for these experiences, as shown in Table 2. The clinical experiences often occurred in inpatient settings, whether in a general medical setting in a hospital or in a residential treatment setting for substance abuse.

Of the CUs that provided experiences in substance-abuse treatment settings, a majority (85 percent) combined two or more of these settings for the clinical exposure.

The clinical experiences were often supplemented with other teaching strategies. Each of the following strategies was used in more than half of the CUs with clinical components: lecture; clinical demonstration (for example, patient interview by instructor); required readings; conference or case presentation; seminar; and films or videotapes. The units with-

TABLE 2

Percentage of Medical School and Residency Curriculum Units on Substance Abuse With Clinical Experiences That Used Each Type of Clinical Treatment Setting, 1986*

Setting	Medical School Units (n = 162)	Residency Units (n = 434)
Type of Clinical Setting Used		
General medical only	21	16
Substance abuse only	19	19
Both	60	65
Type of General Medical Setting Used†		
Ambulatory	48	61
Inpatient	65	71
Emergency	41	52
Type of Substance Abuse Treatment Setting Used†		
Hospital-Based Ambulatory	28	43
Community-Based Ambulatory	25	31
Inpatient	65	68
Self-Help group	50	52
Detoxification	44	56

* Survey questionnaires were designed jointly by four specialty organizations and administered separately by those organizations. See text for details on these organizations, the questionnaires, and the definition of curriculum unit. A total of 294 departments in 98 medical schools and 1,124 residency programs were contacted. Overall, the survey identified 308 units in medical schools and 605 units in residency programs; of these, 162 medical school units had clinical experiences and 434 residency units had clinical experiences.

† Because some units were reported as using more than one setting, the percentages do not total 100.

out clinical experiences tended not to use as great a variety of teaching strategies. Of these units, most (93 percent) used lectures and slightly over half used seminars.

The curriculum units covered a broad range of topics. The topics most frequently covered were related to general concepts (that is, definition, natural history) of substance abuse (95 percent), diagnosis (94 percent), and epidemiology and sociocultural factors (90 percent). Other topics often covered were physicians' attitudes towards substance-abusing patients (87 percent), acute management (89 percent), and long-term management (85 percent). Although covered by 70 percent of the units, prevention was among the topics least frequently addressed.

Within three of the specialties, physicians in that specialty tended to have sole responsibility for teaching the curriculum units: psychiatrists alone were responsible for teaching 70 percent of the psychiatry CUs, pediatricians alone were responsible for teaching 69 percent of the pediatrics CUs, and internists alone were responsible for teaching 51 percent of the internal medicine CUs. Family physicians taught units alone in 12 percent of their units. Nonphysicians (for instance, behavioral science faculty members or substance abuse counselors) teaching alone (26 percent) or in combination with a family physician (26 percent) assumed responsi-

bility for teaching in more than half of the family medicine CUs.

Only 37 percent of all the CUs formally evaluated the residents.

MEDICAL SCHOOLS

Both alcohol and other drugs were covered in a majority (82 percent) of the CUs offered at medical schools. This combination was more often the case in psychiatry than in either family medicine or internal medicine. About three-quarters (74 percent) of the CUs were part of another course, clerkship, or rotation. The balance were separate clerkships or independent courses devoted entirely to substance abuse. Most CUs were required (77 percent) and offered yearly (99 percent). Slightly over one-third specifically addressed tobacco addiction.

Clinical experiences were included in slightly more than half (53 percent) of the curriculum units. A similar proportion of CUs across all specialties provided such a clinical component. Settings in general medical facilities and substance abuse treatment facilities were frequently combined for this clinical exposure, as shown in Table 2. Overall, inpatient settings were more frequently used than outpatient settings. In 74 percent of the units providing clinical experiences in a substance-abuse treatment setting, two or more such settings were used for this clinical exposure.

Each of the following teaching strategies was used in over half of the units with clinical components: required readings, lecture, clinical demonstration, seminar, conference or case presentation, and films or videotapes. The CUs with no clinical components tended to use fewer strategies. Three strategies were used in more than half of these units: lecture, required readings, and films or videotapes.

Examination of the topics covered in the CUs revealed that, as with the residency units, a variety of topics was covered. Over 80 percent of the CUs covered general concepts (that is, definition, natural history) of substance abuse, epidemiology and sociocultural factors, diagnosis, and physicians' attitudes towards substance-abusing patients. The topics least frequently covered were prevention (63 percent of the CUs) and legal aspects (44 percent).

Psychiatrists teaching alone were responsible for teaching a majority (68 percent) of the psychiatry CUs. Responsibility for teaching the internal medicine CUs lay largely with internists alone (48 percent) or with a combination of medical specialties (39 percent). Nonphysicians (for instance, behavioral science faculty members or substance-abuse counselors) assumed total or partial responsibility for teaching in almost half (49 percent) of the family medicine CUs, while approximately one-third (31 percent) were taught by family physicians alone.

A majority of the CUs (76 percent) included evaluation of the students. Such evaluation was more common for psychiatry than for family medicine or internal medicine units.

Discussion

In the four medical specialties surveyed, medical schools and residency programs varied considerably in integrating substance abuse units into their curricula. Where integrated, the units often occurred as part of the required curriculum, tended to address both alcohol and other drugs, and frequently included clinical experiences.

Several conclusions emerge from these findings. First, training in substance abuse is not universally integrated into the medical school and residency curric-

ula of family medicine, internal medicine, and pediatrics. Psychiatry does approach more universal inclusion of substance abuse instruction at both educational levels than do the other specialties. Similar trends have been previously reported (11). Most medical students and residents, therefore, receive some substance abuse training through psychiatry departments and programs. Extending training in substance abuse offered through the other three specialties would lead to a more thorough and integrated coverage of substance abuse and reinforce the importance of the physician's role in early identification and intervention.

Second, where offered, the instruction is generally part of the required curriculum, a situation which represents a significant departure from the past practice of offering substance abuse training primarily as an elective within a clinical program. This change may indicate an increasing acceptance of substance abuse teaching as an integral part of medical training; conversely, it may indicate more acquiescence to outside pressures than true acceptance of substance abuse instruction as a fundamental component of medical education. The finding that substance abuse training usually occurred as part of a larger course, clerkship, or rotation and the finding that responsibility for teaching substance abuse units tended to be assumed by specialists within the department or program offering the unit may reflect increasing pressures on educators to comply with allotments of curricular time for substance abuse.

Third, an appreciation of the value of teaching substance abuse in clinical settings, previously stressed in the literature (6), appears to be increasing. Along with this appreciation may be a growing recognition of the importance of using a combination of teaching methods and clinical settings. Although these are encouraging signs, the practice of using inpatient settings for clinical exposure, especially in a general medical facility, remains questionable. Reliance on inpatient settings, where students and residents are less likely to see patients along the entire continuum of substance use, abuse, and dependence, should be reconsidered. Other options may better enhance learning about prevention, early diagnosis, and intervention.

Fourth, the breadth of topics covered in teaching raises a question about how thoroughly any of these are addressed. The data collected in this study did not provide this information. However, some speculation on the relative priority afforded certain topics may be warranted. Prevention receives a low priority relative to other topics in all specialties at both educational levels. Training in prevention is essential to understanding how best to incorporate early intervention strategies into medical practice. This area of training, in addition to closely related areas such as physician impairment, warrants further investigation.

The results reported here must be interpreted within the context of this study's limitations. First, the survey did not determine the number of instructional hours allotted to substance abuse. It is not known to what extent the curriculum units reported to be part of a larger curricular offering represented a single session or otherwise limited exposure to substance abuse content. Second, variability in the reporting of curriculum units was inevitable with the use of four different administration methods. Additional reporting variability may have resulted from the broad definition given to a curriculum unit. For example, recent evidence from another survey of residency training programs (12) may suggest that

some programs reporting no curriculum units in this survey indeed had a single lecture on substance abuse.

The findings reported here indicate a lack of comprehensive substance abuse instruction across clinical specialties in medical school and residency training. Similar conclusions have been recently reported elsewhere (10). However, the substance abuse instruction in medical training appears to be headed in a positive direction. The increasing inclusion of substance abuse instruction as part of the required curriculum, the opportunities for clinical application, and the attention to both alcohol and other drugs in training are all encouraging. Yet, questions remain concerning the adequacy with which medical students and residents are being prepared to help prevent or intervene early in the development of problems related to substance abuse. Further investigations should be conducted on the relative priority that substance abuse instruction is afforded in the overall clinical curriculum and on the depth and quality of this training.

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Substance Use by Fourth-Year Students At 13 U.S. Medical Schools

Scott Conard, M.D., Patrick Hughes, M.D., DeWitt C. Baldwin, Jr., M.D., Karl E. Achenbach, Ph.D., and David V. Sheehan, M.D.

Abstract—Fourth-year medical students at 13 medical schools in different regions of the United States received an anonymous questionnaire designed to examine their current and prior use of 11 substances and their attitudes toward substance use among physicians. Of 1,427 questionnaires distributed, 41 percent were returned. The questionnaire and distribution method were derived from an ongoing survey on drug use in order to permit comparison of the medical students with a national sample of age- and sex-matched cohorts. The rates of substance use during the 30 days preceding receipt of the questionnaire were: alcohol, 87.8 percent; marijuana, 17.3 percent; cigarettes, 9.0 percent; cocaine, 5.6 percent; heroin, 0.0 percent; other opiates, 0.9 percent; LSD, 0.2 percent; other psychedelics, 0.5 percent; barbiturates, 0.5 percent; tranquilizers, 2.2 percent; and amphetamines, 1.2 percent. Compared with their age and sex cohorts nationally, the medical students reported less use of marijuana, cocaine, cigarettes, LSD, barbiturates, and amphetamines. However, their use of other opiates was approximately the same and their use of tranquilizers and alcohol was slightly higher than that of the other cohorts. Data on their sources of knowledge about drug abuse indicate the need for greater attention to this issue in the medical curriculum.

Available data on medical students' substance use share several major limitations. First, the samples studied were generally small and nonrepresentative. With the exception of a recent study that surveyed 483 medical students and 489 medical practitioners in one state (1), most investigators studied the use of a single drug (2–5) or the students of a single class or school (6–10). A second limitation is that investigators used different survey methods with different questionnaire items, so that substance-use rates in the various studies cannot easily be compared, either with one another or with national samples. Further, when comparisons were made, the influence of demographic vari-

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ables known to affect substance-use rates (for example, gender) were not explored.

To overcome these limitations, the present authors undertook a study of substance use among senior medical students at 13 medical schools in different regions of the United States. A survey questionnaire was used that permitted the sample to be compared with a large national sample of young people of similar age (11, 12). In the present article, the authors report patterns of substance use among the sample of senior medical students and compare these patterns with those of a representative national sample of young people. They also review the study method and its limitations and suggest modifications to be employed in future research.

Methods

The substance-use questionnaire selected was based upon one administered annually to graduating high school students across the country since 1975 (11, 12). To this questionnaire were added a number of items on demographic variables and questions specifically relating to attitudes about substance use and opinions about impaired physicians. Because of the recent increase in cocaine use, questions were asked on that substance. The resulting questionnaire consisted of demographic items (including age, gender, class standing) and 112 items concerning the use of 11 frequently abused substances, the sources of knowledge for these substances, and attitudes toward a physician's use of them.

As with the studies by Johnston and colleagues (11, 12), the sampling approach consisted of selecting schools in different regions of the country as a way of securing a nationally representative sample. Although, a random sampling of all medical students throughout the country might have been more truly representative, the difficulty of securing accurate addresses and the desire for comparability of methods dictated using an approach through selected schools.

In late April 1986, the questionnaires were sent to 13 schools selected from the four major regions of the country: three each from the Northeast, Southeast, and Midwest and four from the West. Because the study started late in the academic year, one selection criterion was that a school's students would not graduate until May or June. Even using this criterion, lower response rates were secured from the schools with earlier graduation dates.

The questionnaires, along with letters guaranteeing anonymity and confidentiality, were mailed directly to the president of the senior class at each medical school with the exception of one in the West, where the questionnaires were sent to the dean of students' office. To elicit cooperation in distributing the questionnaires and to enhance the response rate, a small honorarium was paid to each class president. No financial incentive was offered to the students. Follow-up telephone calls were made to the class presidents asking them to encourage the cooperation of nonresponding classmates, although no individual contact or second mailing to nonrespondents was possible. Class presidents provided each graduating senior with a copy of the questionnaire, a separate machine-readable answer sheet, and a stamped return envelope addressed to the first author.

Results

Of 1,427 questionnaires distributed, 589 usable responses were received, for an overall response rate of 41 percent. A check for internal consistency was performed on the substance use data. Discrepancies in the responses for alcohol

use were found in five records and for cocaine use in one record. These records were excluded from analyses involving alcohol or cocaine, respectively.

The mean age of the sample was 27.6 years, with 74.7 percent of the students in the age category of 25–29 years. Women comprised 35 percent of the total sample, which is a percentage comparable to national figures on sex distribution among medical students. Forty-nine percent of the study group were single and 44 percent married, with the remainder separated, divorced, or widowed. A majority of the respondents were white (88 percent) with Asians constituting 6.3 percent, Hispanics 3.4 percent, blacks 2.2 percent, and Alaskans or Native Americans 0.2 percent. The distribution of self-reported class standing for the total sample was markedly skewed, with only 9 percent placing themselves in the lower third of their class; 35 percent reported being in the middle third, while 55 percent reported being in the upper third. These findings suggest that the sample was biased toward students reporting higher class standing.

SUBSTANCE USE

Figure 1 presents the overall prevalence of substance use by the total sample of 589 respondents. For each of the 11 substances, the figure shows the percentage of medical students who reported use ever in their lifetime, in the past year, in the previous 30 days, and 20 or more times in the previous month (designated as daily use). Patterns of use for all 11 substances are discussed below, starting with the most frequently used substance (alcohol) and proceeding to the least frequently used (heroin).

Alcohol was clearly the most widely used drug, with 97 percent reporting at least one use in their lifetime, 95 percent in the previous year, 88 percent in the previous month, and 9 percent daily. These rates are consistent with those reported by Maddux and colleagues (10), among whose medical students, 96 percent reported using alcohol in their lifetime, 91 percent in the previous year, and 82 percent in the previous month.

Marijuana was the second most frequently used substance, with 74 percent reporting use in their lifetime, 32 percent in the previous year, 17 percent in the previous month, and 1.2 percent daily. These rates are also consistent with surveys of medical students by McAuliffe and colleagues (1). Of those students, 72 percent reported using marijuana in their lifetime, and 34 percent in the previous year.

Cocaine was the third most frequently used substance, a somewhat alarming but not surprising finding, given the national epidemic of cocaine use at the time of the study. (This survey was done prior to the much-publicized cocaine-related deaths of athletes Len Bias and Don Rogers.) Thirty-six percent of the students reported cocaine use in their lifetime, 17 percent in the previous year, and 6 percent in the previous month; no students reported daily use. These responses are comparable with those reported by McAuliffe and colleagues (1)—39 percent had used it in their lifetime and 20 percent in the previous year. The only study that examined cocaine use in medical schools prior to the 1980s reported much lower rates of use (13).

Cigarettes ranked as the fourth most frequently used substance in the previous year (13 percent), with 9 percent having smoked cigarettes in the previous month and 5 percent daily. The questionnaire did not ask about any use in their lifetime. These data again correspond closely with those of Maddux and colleagues' (10)

sample, 12 percent of whom reported smoking cigarettes in the previous month.

Tranquilizers, including benzodiazepines, were the fifth most widely used substance, used in their lifetime by 22 percent, in the previous year by 11 percent, and by 2 percent in the previous month; none reported daily use.

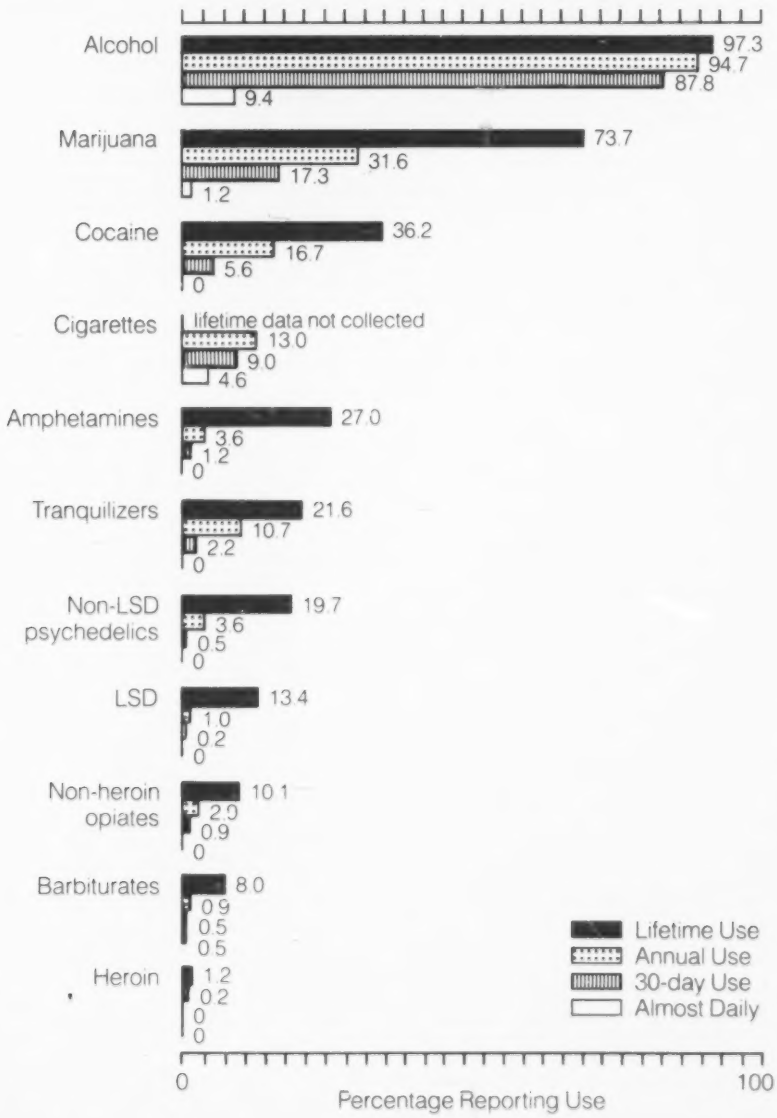

FIGURE 1

Percentage of 589 fourth-year students at 13 regionally distributed U.S. medical schools who reported using each of 11 substances at least once in their lifetime, in the previous year, in the previous month, and daily, 1986.

Amphetamines appear to have been infrequently used by this medical student sample. Although 27 percent reported using these substances at least once in their lifetime, less than 4 percent had used amphetamines in the previous year, 1 percent in the previous month, and none reported daily use. McAuliffe and colleagues (1) found that 17 percent of the medical students they questioned had ever used stimulants, and 2 percent were occasional users at the time of their study.

Psychedelics, excluding D-lysergic acid diethylamide (LSD), were the seventh most frequently used substances. Again, 20 percent reported use in their lifetime, but use at the time of the study was less than 4 percent in the previous year, less than 1 percent in the previous month, and no daily use. McAuliffe and colleagues (1) found similar use rates, with 19 percent reporting recreational use ever in their lifetime and 2 percent reporting occasional use at the time of the study.

LSD had a reported lifetime use of 13 percent, with 1 percent in the previous year and 0.2 percent in the previous month. These data suggest that about one in seven of the respondents may have used LSD at some time but that virtually none of them was using this substance at the time of the survey.

Opiates other than heroin were used by only 10 percent of the sample during their lifetime, with 3 percent having used them in the previous year, less than 1 percent in the previous month, and no daily use. Opiate use by physicians has been of historical interest due to concern over reported dependence among physicians. The sample reported on here did not show any particular preference for opiates. These findings are consistent with those of McAuliffe and colleagues (1), where only 8 percent had ever used opiates recreationally and 2 percent reported occasional use at the time of the survey. However, Maddux and colleagues (10) reported much higher (40 percent) lifetime use (mostly codeine), 19 percent in the previous year and 6 percent in the previous month.

Barbiturate use at some time in their life was reported by less than 8 percent of medical students. Less than 1 percent reported use in either the previous year or the previous month. Given the declining use of these substances in clinical practice, these data raise the question of whether abuse of these substances by medical students and physicians may soon be largely of historical interest only. McAuliffe and colleagues' (10) data on recreational use of sedatives were similar, with 11 percent of their respondents reporting recreational use in their lifetime and no one reporting recreational use at the time of the study, although 1 percent reported occasional self-treatment and another 1 percent regular self-treatment. Maddux and colleagues' (10) rates for sedative use were higher, with 17 percent reporting use in their lifetime, 3 percent in the previous year, and 2 percent in the previous month.

Heroin was the least used substance, with only 1 percent having ever used it and less than 0.2 percent using it in the previous year. None used it in the previous month. Neither Maddux and colleagues (10) nor McAuliffe and colleagues (1) reported on heroin use.

SOURCES OF KNOWLEDGE

The respondents were asked to identify their major source of knowledge for each substance except cigarettes. Their responses, shown in Table 1, suggest that reading and lectures were the primary sources of drug information. The exceptions were alcohol and marijuana, for which friends and acquaintances were reported to be the most important sources (29.7 percent and 50.8 percent, respec-

TABLE 1

Percentages of 589 Fourth-Year Students at 13 Regionally Distributed Medical Schools Reporting Their Major Source of Knowledge for 13 Substances, 1986

Drug	Friends or Acquaintances	Family	Reading	Patients	TV, Films, Radio	Lecture	No Response
Alcohol	29.7	10.4	27.2	4.4	4.9	22.8	0.7
Marijuana	50.8	2.4	29.5	0.0	6.5	9.8	1.0
Cocaine	23.6	0.7	36.7	1.7	12.9	23.4	1.0
Heroin	3.1	0.3	46.4	2.9	14.9	31.1	1.4
Narcotics	2.6	0.0	47.4	1.9	8.3	38.4	1.5
LSD	17.8	0.8	44.1	0.3	14.1	21.7	1.0
Other Psychedelics	17.2	0.7	42.6	0.7	11.7	25.8	1.4
Barbiturates	4.8	0.5	47.2	0.5	4.8	41.3	1.0
Tranquilizers	4.8	1.2	46.0	1.4	4.8	40.7	1.2
Amphetamines	12.6	0.5	44.7	0.0	6.1	35.3	0.8

tively). Also of note was the relatively greater importance of friends and acquaintances (23.6 percent) and TV, film, and radio (12.9 percent) for knowledge about cocaine. Little reliance upon clinical contact with patients as a major source of knowledge was seen for any of the substances.

ATTITUDES

The students were asked to choose from a list of possible consequences for physicians who used various substances from once or twice to regularly. Table 2 indicates that the respondents recommended different consequences for different substances. For example, over 96 percent felt that experimental use (once or twice) of alcohol and marijuana should carry no negative consequences for the physician. In contrast, half the students (52 percent and 49 percent, respectively) felt that physician experimentation with heroin or barbiturates should have consequences ranging from mandatory treatment to suspension or revocation of the medical license. Attitudes toward experimental use of amphetamines, cocaine, and LSD were intermediate between these two responses, though LSD use was viewed as more serious than the other two.

The respondents also recommended different consequences based upon the frequency of drug use. For example, the great majority felt that physicians who regularly used any of the drugs listed should be required to receive treatment and have their licenses suspended or revoked. Also, 87 percent felt that regular heroin use should result in license suspension or revocation, and 74 percent responded similarly for regular LSD use. Regular marijuana use was judged as of less concern; 19 percent recommended no consequences for regular physician users, while a majority (59 percent) recommended required treatment. Their concern for frequency of use was also striking in the case of alcohol, where a majority (67 percent) accepted one or two drinks most days with no consequences but reversed their views for four to five drinks most days, for which only 4 percent felt there should be no serious consequences.

Comparison with National Sample

Whether the substance-use rates reported in the present survey should signal alarm or encouragement depends on how these rates compare with rates for other people of the same age. Although several studies

TABLE 2

Percentages of 589 Fourth-Year Students at 13 Regionally Distributed Medical Schools Recommending Each of Five Responses to Physicians' Use of Seven Substances, 1986

Physicians' Use	Recommended Response				
	Do Nothing	Require Treatment	Suspend License	Revoke License	No Response
Trying marijuana once or twice	95.9	3.4	0.5	0.0	0.2
Smoking marijuana occasionally	76.4	20.2	2.2	0.3	0.8
Smoking marijuana regularly	18.7	58.6	21.1	1.0	0.7
Trying LSD once or twice	63.7	18.7	13.2	2.9	1.5
Taking LSD regularly	1.4	23.3	60.4	14.1	0.8
Trying heroin once or twice	46.2	29.4	18.3	4.9	1.2
Taking heroin occasionally	5.8	37.5	45.0	10.4	1.4
Taking heroin regularly	1.5	10.5	63.9	23.6	0.3
Taking barbiturates occasionally	49.6	36.0	10.9	2.4	1.2
Taking barbiturates regularly	1.9	38.7	52.6	6.5	0.3
Trying an amphetamine once or twice	77.3	13.2	6.3	2.2	1.0
Taking amphetamines regularly	2.4	47.5	43.5	5.3	1.4
Trying cocaine once or twice	76.1	13.2	7.0	2.5	1.2
Taking cocaine regularly	1.5	38.9	50.8	7.8	1.0
Trying one or two drinks of an alcoholic beverage	97.8	1.4	0.3	0.0	0.5
Taking one or two drinks nearly every day	67.2	27.0	3.9	0.3	1.5
Taking four or five drinks nearly every day	3.9	48.0	45.3	1.5	1.2
Having five or more drinks once or twice each weekend	36.5	43.6	17.8	1.5	0.5

have attempted to compare medical students with other professional students (1, 7), none compared them with same-age cohorts in the general population.

Using items from the survey instrument used by Johnston and colleagues (11, 12) permitted the present authors to compare their own sample of medical students with Johnston's nationally representative sample of over 2,500 (the exact number varies from question to question in the survey) young people, originally surveyed in 1976–78 as high school seniors and surveyed again in the second half of 1985, roughly eight months prior to the present study. The mean age of the Johnston sample at the time of the present study was 26.3 years, slightly younger than the 27.6 years recorded for the medical student group. Seventy percent of the Johnston sample were high school graduates and 30 percent college graduates. Fifty-five percent were women. Because epidemiological research on drug abuse has established that men are more likely to be substance users, and because it was deemed desirable to compare medical students with high school and college graduates of similar age, the sample of medical students in the present study were compared with the Johnston sample, controlling for education and sex. For brevity, only the five most frequently used substances in the present study are discussed below.

The percentage of medical students who reported using alcohol in their lifetime (97 percent) is similar to that of their counterparts in the larger society (97 percent for college and 95 percent for high

school graduates). Daily use among men was greater than that among women for both samples. Both men (90 percent) and women (84 percent) medical students were more likely to have used alcohol in the previous month than college-graduate men (86 percent) and women (79 percent and high-school–graduate men (82 percent) and women (68 percent); however, this different was not statistically significant ($p > .05$).

Figure 2 shows that use of marijuana in their lifetimes for the men and women medical students was similar to that of their respective sex cohorts in the national comparison sample. When marijuana use in the previous year and month was compared, however, there was a clear tendency for the medical students to use this substance less frequently than either the high school or college graduates. For the previous year, 32 percent of the medical students (men, 36 percent; women, 24 percent), 36 percent of the college graduates (men, 41 percent; women, 31 percent), and 39 percent of the high school graduates (men, 47 percent; women, 33 percent) reported use. For the previous month, the medical students reported a rate of 17 percent (men, 21 percent; women, 11 percent), while the figures for the college and high school graduates were 21 percent (men, 34 percent; women, 22 percent) and 27 percent (men, 34 percent; women, 22 percent), respectively. The relationship is clear for both sexes and is statistically significant (chi-squares: previous year = 6.69, previous month = 17.07, $p < .05$). Only 1 percent of men and women medical students reported daily marijuana use, while these percentages were 5.5 percent and 2 percent respectively for college graduates and 11.3 percent and 5 percent for high school graduates.

Cocaine use showed a similar pattern,

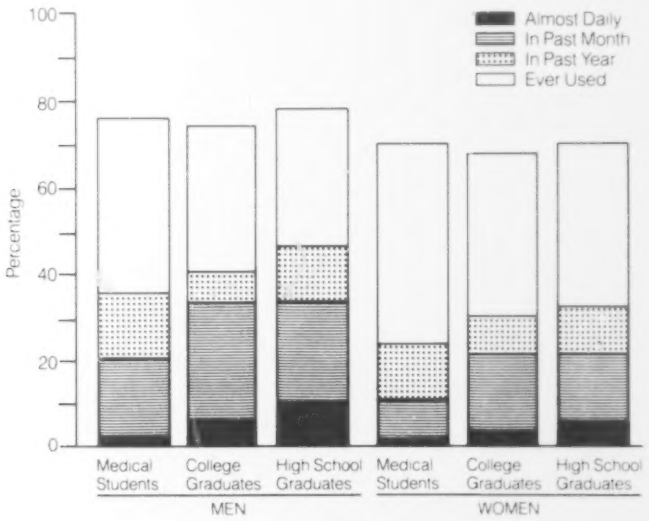

FIGURE 2

Percentages of 589 fourth-year students at 13 regionally distributed U.S. medical schools and of approximately 2,500 high school and college graduates (data on graduates from Johnston and colleagues [11]) who reported using marijuana at least once in their lifetime, in the previous year, in the previous month, and almost daily, 1985–1986.

with the medical students less likely and the high school graduates more likely than the college graduates to have used this substance in the previous year and month. For the previous year, 17 percent of the medical students (men, 21 percent; women, 11 percent), 20 percent of the college graduates (men, 26 percent; women, 14 percent), and 23 percent of the high school graduates (men, 29 percent; women, 18 percent) reported use. For the previous month, 6 percent of the medical students (men, 7 percent; women, 4 percent), 8 percent of the college students (men, 8 percent; women, 7 percent), and 10 percent of the high school graduates (men, 14 percent; women, 8 percent) reported use. The only daily users were men high school graduates. These differences are statistically significant (chi-squares: previous year = 7.35, previous month = 10.62, $p < .05$).

Figure 3, on the use of cigarettes, shows the most dramatic differences between the samples. Only 4 percent of the men medical students in this study were daily smokers, a rate that is one-tenth the rate (40 percent) for men high school graduates of similar age. While 5 percent of the women medical students used cigarettes daily, they were about one-seventh as likely to be daily smokers as their high school counterparts (34 percent). These differences also are statistically significant (chi-squares = 207.15, $p = .0001$).

The data for tranquilizer use show that both the men (11 percent) and women (10 percent) medical students were more likely to have used tranquilizers in the previous year than their age-related counterparts. The men medical students were slightly more likely to have used tranquilizers in the previous month (13 percent) than the other men (1 percent for men college graduates and 2 percent for men high school graduates). These differ-

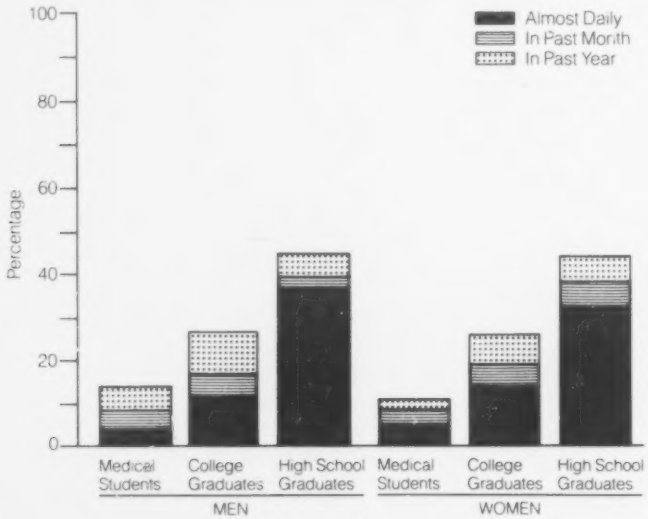

FIGURE 3

Percentages of 589 fourth-year students at 13 regionally distributed U.S. medical schools and of approximately 2,500 high school and college graduates (data on graduates from Johnston and colleagues [11]) who reported using cigarettes in the previous year, in the previous month, and almost daily, 1985–1986.

ences also are statistically significant (chi-squares: previous year = 10.78, previous month = 9.22, $p < .05$).

Discussion

This study demonstrated the feasibility of collecting national data on medical students' substance use. By using a questionnaire already in use elsewhere, the medical student data could be compared with that of a large, representative national sample of young people surveyed in 1985. By controlling for gender, the researchers could compare medical students' substance use with that of their counterparts in the larger society, matched by age, sex, and education.

Because the present study had a 41 percent response rate from a sample possibly skewed toward the upper one-third of the medical class, any interpretations of the data and generalizations of the results to all medical students must be viewed with caution. However, the following findings appear worthy of note:

1. As expected, the types of substance use among senior medical students appear to resemble those of their age peers in the general society. However, the medical students were significantly less likely to be current users of marijuana, cocaine, and cigarettes than their contemporaries. Because the college graduates in the comparison sample held an intermediate position between age-related high school graduates (highest rates of use) and medical students (lowest rates), the observed differences may be more the result of increasing education, socioeconomic status, or self-selection of those choosing professional life than of medical student status alone.

2. The medical students reported somewhat higher rates of alcohol and tranquilizer use in the previous year and month than their age-related cohorts.

3. The rates of use for the other major substances were low for both medical students and the national sample. The medical students' experience with amphetamine-type substances appears especially low (27 percent) when compared with medical student surveys of two decades ago, when Smith and Blachly (2) reported 44 percent as using them in their lifetime and Watkins (3) reported 54 percent.

4. Daily substance users are of particular interest, as they would seem to be at greatest risk for substance dependence and impairment. In this category, there was more daily alcohol use by the medical students (9 percent) than by the college (4 percent) or high school graduates (8 percent). It should be remembered, however, that the present survey was taken during the last weeks of medical school and may reflect the examination stress and/or party spirit of that period. Although 1.2 percent of the medical student respondents reported daily marijuana use, this figure was much lower than the figures for the college (3.8 percent) and high school graduates (7.6 percent). Cigarettes, the third and only other substance to be used daily, showed dramatically lower rates among the medical students. The relatively low rates of daily use in this medical student sample also suggest low rates of drug dependence at this stage of their careers.

Perhaps the most encouraging finding in this study is the extremely low rate of cigarette use at the time of the study. It cannot be determined whether this was a result of education about cigarette smoking on the broadest level, a specific effect of medical school education including clinical experience with the pathological effects of smoking, or some combination of the two. Nevertheless, it does suggest

that similar campaigns against alcohol, marijuana, and cocaine use might conceivably produce similar results.

Data on the medical students' sources of information about such substances also point to a need for increased attention in medical school curricula. The students learned much about opiates, barbiturates, amphetamines, and tranquilizers in their courses, as these drugs are or have been important elements in the therapeutic armamentarium. However, the two most abused substances in the survey (alcohol and marijuana) are not used in clinical practice, and the data suggest that students look outside the medical curriculum to learn about them. The use of alcohol, marijuana, and cocaine might be considerably different if these substances were given emphasis comparable to that given opiates, tranquilizers, antibiotics, and antihypertensive medications. In this regard, efforts to improve substance abuse education for medical students and house staff members are encouraged. There is clearly a need to teach medical students about substance abuse and to evaluate the impact of such instruction.

The medical students' attitudes toward physicians who use drugs were not global and stereotyped; rather, they appear to be based on judgments about the relative risk of the specific substance and the frequency of use. The data contain some hopeful signs that these young members of the profession view physician drug use as a serious matter. They did not accept regular use of any of the substances by physicians and rejected even experimental use of the more dangerous drugs. Their responses suggest that they would support substance abuse programs for impaired physicians that combined treatment with varying degrees of sanctions, depending on the drugs of dependence and severity of impairment.

Finally, the study reported here raises policy issues that should be addressed. The authors believe that the results of such research should not be used to sensationalize medical students' substance use or to institute unreasonable policies and restrictions. Rather, such studies should suggest ways to improve medical school programs and to identify medical students and young physicians at risk for drug dependence so that early preventive and rehabilitative intervention can occur.

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DĀTAGRAM: Substance Abuse Policies and Programs at U.S. Medical Schools

Since the 1960s there has been concern over increasing rates of substance use and abuse in the population, especially among young people. Although chemical dependency and impairment among physicians should be considered serious at any level, thus far there has been a lack of reliable data on the use and abuse of such substances among members of the medical profession (1). Elsewhere in this issue, Conard and colleagues report that cumulative lifetime experience with various drugs and controlled substances among medical students is similar to that of the general population, a not-unexpected finding. However, those authors report figures for daily, monthly, and annual use among medical students that appear to be significantly lower than comparable figures for such use among age-related groups of high-school and college graduates, except for alcohol and tranquilizers.

In addition, studies by Maddux and colleagues (2) and Clark and colleagues (3) suggest that patterns of substance use and abuse generally antedate admission to medical school. Clark's group also showed that alcohol use quantitatively declined during medical school, especially during the clinical years.

Encouraging as these figures are, it is clear that if substance abuse is to be prevented among members of the profession, medical schools have a responsibility to establish clear guidelines and policies defining appropriate professional behavior, especially regarding the use of alcohol and drugs. They also need to take responsibility for designing programs of prevention, identification, and rehabilitation for potential abusers. As if this was not sufficient stimulus, several states, as well as Section 487(10) of the recent reauthorization of the Higher Education Act of 1965, have mandated that institutions of higher education have in place policies and programs relating to substance abuse.

Methods

To determine the extent to which U.S. medical schools have substance use and abuse policies and programs, in March 1987 a letter and 12-item questionnaire were mailed to the offices of student affairs of all 124 U.S. medical schools, with the exception of those located in Puerto Rico. A follow-up letter and questionnaire were mailed in July to nonrespondents. The questionnaire sought to secure data on the existence and nature of policies and procedures for identification, treatment, and prevention of substance abuse and whether these were formal or informal, written or unwritten.

Results

Responses were received from 94 schools (76 percent), with one of these schools declining to complete the questionnaire. Cross-tabulations were done using the standard U.S. census regions used by the American Medical Association.

The responses are displayed in Table 1. These data indicate that only 22 percent

TABLE 1

Numbers of U.S. Medical Schools, By Region and By Public or Private Status, with Policies and Programs for Identifying and Treating Substance Abuse by Students, 1987*

Region/Type	No. Surveyed	No. Responding	Had No Policy or Program	Had Formal Policy	Had Formal Identification Program	Had Treatment Program	Were Planning a Program
Region							
New England	8	6	2	1	1	1	2
Middle Atlantic	21	12	7	1	0	0	3
East North Central	19	15	10	1	1	1	9
West North Central	13	11	8	1	1	1	7
South Atlantic	24	16	8	6	4	2	5
East South Central	9	7	2	4	3	2	0
West South Central	14	13	7	3	3	2	8
Mountain	4	2	2	0	0	0	0
Pacific	12	11	6	3	2	2	4
Total	124	93	52	20	15	11	38
Type							
Public	74	58	31	14	11	7	21
Private	50	35	21	6	4	4	17

* All 124 U.S. medical schools (but not those in Puerto Rico) were sent questionnaires; 94 responded, and one of these declined to participate.

of the responding schools had a written policy on medical student impairment, while an additional 28 percent had informal or unwritten policies. The fact that 41 percent of the schools were interested in developing such policies indicates a growing awareness of the need for them.

Discussion

The relatively low number of schools reporting formal substance abuse policies and programs in this study appears to be in line with data gathered in a recent (unpublished) national survey of substance use and abuse among 2,047 senior medical students in 23 regionally distributed medical schools. Only 25 percent of the students responding to that survey were aware of any policy on substance abuse at their institution. In addition, Jonas and Etzel (4) recently reported that only 32 percent of 126 U.S. medical schools responding to a question on Part II of the Liaison Committee on Medical Education questionnaire in 1988 claimed to have a written policy on substance abuse.

Employee assistance programs in industry and business have found that the most important initial step in preventing impairment is to have formal policies and programs on substance-abuse identification and treatment. Indeed, all 50 states now have organized impaired-physician committees or equivalent structures. That only 22 percent of the respondents to the present survey, or some 16 percent of all U.S. medical schools, reported having a formal policy for identification and treatment of substance use and abuse by medical students suggests that medical students are not receiving adequate or appropriate direction concerning this aspect of professional conduct and behavior and that American medical schools could be

in violation of new federal and state guidelines.

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Survey on Curriculum Committees At U.S. and Canadian Medical Schools

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Abstract—A 27-item questionnaire was sent to 144 U.S. and Canadian medical schools to identify prevailing patterns in the organization, philosophy, and function of curriculum committees. Overall, 76 percent responded, with 67 percent of the respondents being school administrators and 33 percent being faculty members. Fifty-one percent rated their school's committee as exerting a significant impact on the educational program over the previous five years. Fifty-six percent of the committees had a routine procedure for course review and used data from multiple sources when conducting curriculum evaluations. The committees that annually received a specific assignment from the dean were the most likely (91 percent) to be rated as having a significant impact, followed by committees that conducted frequent course reviews (66 percent). Thirty-eight percent of the committees were primarily faculty oriented, 29 percent were decidedly administrative in composition, and the remaining committees exhibited a mixture of membership.

The report of the Project Panel on the General Professional Education of the Physician (GPEP) (1) focused attention on the process of educational decision-making in medical school. Although their information is primarily anecdotal, the present authors feel that a number of medical schools have been prompted by the GPEP report to assess not only the nature of their curriculum but also the instructional implications of a health care system which has become increasingly competitive, cost conscious, and corporate-like in structure. For example, Vanselow and Kralewski (2) described several organizational trends in health services that are already influencing the education of medical students: the emergence of corporate hospital systems; the rapid increase in multispecialty group practices; the growth of health maintenance organizations (HMOs), and the increase in numbers of physicians who are salaried employees. The first three developments have restricted patient referrals to teaching hospitals and shortened length of stay, thus placing strain on the traditional educational patterns of clinical clerkships. The fourth change has strong implications for job placement since HMOs are now employing over 25 percent of all physicians not working for the federal government (3). In addition to these

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changes, there is also recognition among medical educators that the size and characteristics of the applicant pool may be changing, with unpredictable effects upon the medical school curriculum.

As a consequence of these changes in the health care system, education decision-makers in medical schools face the dual problem of responding to the standard issues of course content, curriculum density, and course sequencing and to the forces that may substantially reshape the health care environment. The manner in which medical schools analyze their curricula in light of these internal and external factors and make adaptive changes will be critically important to the appropriateness and quality of medical student training in coming years. Presumably, curriculum committees will be in a position to exert a substantial influence on this process in either a positive or negative manner. For instance, Siu (4) and colleagues reviewed modifications in the curricula of medical schools and concluded that most modifications were short-term programs that did not address critical issues. They urged curriculum managers to take a more radical approach to curriculum revision.

An abundance of textbooks are available on the theories and heuristics of curriculum planning and/or evaluation, and a series of monographs (5–7) is directed at curriculum issues in medical education. There is also substantial literature on the dynamics of organizational change (8, 9). However, only a few researchers have examined the relationship of the curriculum committee to campus decision-makers such as the dean, department chairpersons, and influential senior faculty members. Hefferlin (10) and Bucher (11) studied the complex set of environmental conditions that affect the fate of proposed educational reforms. Both authors emphasized the critical role played by administrators during the process of winning support for an innovation and during implementation. Burg and colleagues (12) described a system for managing curriculum revision in medical school which involves a high degree of sensitivity to organizational, political, and communication issues.

Kuske and colleagues (13) evaluated the nature and methods of curricular change in 40 southern medical schools just prior to the publication of the GPEP report. The curriculum committees at these institutions played a substantial role in originating proposals for change and as a mechanism for discussion, but veto power most commonly rested with the dean and department chairmen. This study also documented the types of curricular changes implemented, the reception by faculty members and students, and the degree of subsequent support from decision-makers. Harden (6, 7) discussed a number of curriculum management issues and the merits of various patterns of involving faculty members in the review process. Ewan (14) analyzed the success and failure of curriculum reforms in terms of institutional barriers to change. Finally, the Executive Council of the Association of American Medical Colleges recommended that the curriculum committee should be composed exclusively of department chairmen rather than elected and/or appointed faculty members or course coordinators (15).

Methods

Because of the paucity of data about curriculum committee operations and their influence in decision-making, the present authors developed a questionnaire to identify national trends and practices that would be useful to medical school administrators, curriculum managers, and fac-

ulty members as they establish mechanisms for program evaluation. The questionnaire addressed four areas: organization and membership; philosophies of the role of the curriculum committee; performance of tasks endorsed by curriculum specialists as essential to proper planning and/or evaluation; and the relationship between perceptions of a curriculum committee's impact and a number of variables, including orientation and composition of the committee, curriculum review procedures, the dean's annual charge to the committee, and the presence of educational psychologists on the committee. The questionnaire concentrates mainly on the structural and procedural aspects of curriculum committees and does not address important political issues such as consensus-building or the give-and-take bargaining among departments. The questionnaire also does not directly address informal sources of power within the institution. These informal power sources can include trusted administrative assistants in the dean's suite who exert influence beyond their position, faculty members who have established a personal relationship with the dean or a chairman, networks of respected senior faculty members whose opinions are sought on important issues, and directors of support services (library, student services, laboratories) who can exert influence by controlling facilities and personnel. All of these factors (consensus-building strategies, departmental bargaining, and informal power) can stimulate or stifle curricular modifications. These variables will be explored in a follow-up study by interviewing key participants in curriculum planning at a representative sample of medical schools.

A 27-item questionnaire was drawn up in the summer of 1986 based on the concerns and questions of curriculum committee members at the University of Texas Medical School at San Antonio. A forced-choice format was employed, with respondents being requested to check applicable options listed below each question. A write-in section followed each question to allow for amplification. A final, open-ended essay item was included to obtain viewpoints on issues not directly addressed by the other questions. The questionnaire was critiqued by curriculum committee members and by four educational psychologists experienced in questionnaire design and curriculum development.

Following modifications, the investigators conducted a pilot test of the questionnaire at 14 medical schools. The questionnaire was mailed in October 1986 to the dean, the associate dean for academic affairs, and the curriculum committee chairperson at each of the schools. At least two individuals responded from each school (overall, 30 of the 42 recipients). Comparisons of these responses indicated a high degree of consistency among the different respondents at 13 of the 14 schools. Based on this finding, the investigators concluded that the final questionnaire could be sent to the associate dean for academic affairs at each school with directions that the questionnaire could be forwarded to either the dean or curriculum committee chairperson if these individuals would be in a better position to respond.

After further editing based on the pilot test, the investigators mailed the questionnaire in March 1987 with a cover letter and a stamped, preaddressed return envelope to 128 medical schools in the United States (including one school on provisional status) and 16 schools in Canada. A total of 113 responses were obtained of which 109 were usable (76 percent). Approximately two-thirds of the

respondents were from the dean's office (dean or associate dean) and the remainder were faculty members (most commonly the curriculum committee chairperson) and educational consultants (five questionnaires were completed by educational consultants employed by the medical schools).

Chi-square analysis was used, when appropriate, to assess the responses. The responses were also analyzed in terms of the age of the school (those created since 1967 and those older) and their location (U.S. schools versus Canadian schools). The age of medical schools was examined to see whether perceptions of the curriculum committees at the recently created schools, with still evolving curricula, differed from the perceptions of curriculum committees at well established schools. The Canadian medical schools were analyzed as a separate group because many of these schools have five-year programs based on the type of curriculum found in European medical schools.

Results

The resulting data are presented according to the major themes of the questionnaire: organization, membership, philosophy, performance of curriculum planning and evaluation tasks, and perceptions of a committee's impact. In the following presentation of the results, all responses are based on the number of medical schools that had an active school-wide curriculum committee ($n = 105$) unless a different number of schools is specified. All percentages have been rounded to the nearest whole number.

ORGANIZATION

Sixty percent ($n = 66$) of the responding institutions had only a single, school-wide curriculum committee that dealt with the entire curriculum. Thirty-six percent ($n = 39$) had separate committees for each year in the curriculum as well as a school-wide curriculum committee. Thus, a total of 105 respondents indicated that their medical school had a school-wide curriculum committee that either functioned alone or in conjunction with other curriculum committees set up for each curriculum year. Three medical schools had curriculum committees for each academic year but did not indicate that their school had a school-wide curriculum committee. One respondent reported that their medical school did not currently have an active curriculum committee of any type. Approximately 70 percent of the 105 schools with a school-wide curriculum committee reported that their committee functioned as an independent committee, while the remaining 30 percent reported that theirs were subcommittees of other campus organizations, most often the faculty council or the school executive committee.

Many respondents supplied write-in comments to supplement their answers to the organizational questions. The most frequent comment was that the freestanding curriculum committees were autonomous only in theory; in practice, one or more other campus groups wielded both formal and informal veto power over committee proposals or were capable of tabling and/or altering a curricular recommendation.

Chairpersons of these 105 school-wide curriculum committees were most commonly faculty members appointed by the administration (38 percent) or an academic dean (24 percent); in 20 percent of these schools, the curriculum committee elected one of its own members as the chair; and in the remaining 18 percent, the faculty senate elected or appointed the chairperson, usually after consultations with the dean's office. The chairper-

son had a permanent appointment or served for an extended period of time at the dean's discretion in 66 percent of the 105 institutions responding to this question; the chairperson changed annually at 34 percent, and in these schools the chairperson was almost always a faculty member (33 of the 36 schools). Medical schools created in the past 20 years ($n = 34$) were less likely to have an administrator chair the curriculum committee than schools created before 1967 (12 percent versus 29 percent). The school-wide curriculum committees received a specific charge or assignment annually from the dean or another administrator in 32 percent of the 106 schools responding to this question; 46 percent responded that the committee received a charge only as the need arose; and 22 percent reported that the dean did not designate a task or problem for the committee to act upon during the year. The school-wide curriculum committees most commonly met once a month (55 percent); 19 percent met less frequently (for example, quarterly); and 26 percent met at least twice a month.

MEMBERSHIP

Table 1 shows the categories of membership in school-wide committees. Membership data were difficult to report since there were a number of overlapping categories. However, several patterns are evident. Students were frequently represented on the school-wide committees (in 82 percent of the schools as voting members). School administrations had substantial influence in many committees. Virtually all the respondents reported several administrators serving as ex-officio members, and more than one-third re-

TABLE 1

Percentages of Curriculum Committees at 105 U.S. and Canadian Medical Schools That Contained Members From Each of 15 Categories, 1987*

Categories	Official Voting Members	Ex-Officio Nonvoting Members
Students	82	7
Course directors	50	7
Administrators		
All academic deans	38	n/a
Dean	n/a	21
Associate dean for academic affairs	n/a	48
Associate dean for clinical affairs	n/a	10
Associate dean for students	n/a	34
Faculty members		
Appointed by dean	31	0
Elected by colleagues	31	0
Appointed by department chairpersons	16	0
Department chairpersons	35	1
Department educational coordinators	26	0
Educational psychologists	19	23
Director of admissions office	40	8
Director of student affairs office	15	11
Other†	15	15

* Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16).

† Alumni, library director or librarians, community physician, university registrar, representatives from schools of allied health, dentistry, nursing and pharmacy, and representatives from county medical society.

ported that academic deans and department chairpersons served as regular voting members. Course directors and department education coordinators were reported as members by 76 percent of the respondents, although in many departments one individual held both positions simultaneously. Educational psychologists participated in 19 percent of the committees in voting capacities and 23 percent of the committees as ex-officio members. The Canadian medical schools were the most likely (75 percent) to include an educational psychologist or instructional specialist on the committee, while the recently established (20 years old or less) U.S. medical schools were the least likely (14 percent). The recently established schools were also less likely to include course directors (35 percent) and administrators (26 percent) than the older schools, which reported course directors serving on 57 percent of curriculum committees and administrators serving on 44 percent.

Overall, three general patterns of membership were evident for the school-wide curriculum committees: (*a*) committees chaired on a permanent basis by an administrator and primarily composed of deans and department chairpersons; (*b*) committees chaired by elected and/or appointed faculty members, who usually serve one-year terms, and composed of faculty members; and (*c*) committees between these two extremes (containing a mixture of administrators and faculty members). Thirty of the schools (29 percent) demonstrated a pronounced administrative orientation to their curriculum committee, 40 appeared to have a predominant faculty orientation (38 percent), and the remainder fell into the middle category (33 percent).

In the 42 schools reporting the existence of separate curriculum committees for each curriculum year, membership on these yearly committees consisted mainly of course directors (71 percent) and students (60 percent). The chairperson was generally a faculty member (about 80 percent).

ROLE AND PHILOSOPHY

There was considerable agreement about the role and philosophy of the school-wide committee: 86 percent indicated that their schools' committees were primarily concerned with planning and/or monitoring the broad scope of the teaching program, while 57 percent indicated that reviewing proposals for new courses and/or course revision plans was a prime committee role. Less than 20 percent reported that the school-wide committee was involved in the day-to-day details of scheduling and monitoring individual courses. Only 14 percent felt that the school-wide committee at their school should primarily function as a forum for faculty discussion of general curricular issues. Only 3 percent felt that the school-wide committee should serve as a special advisory group to the administration for curricular issues.

Committees established for each curricular year dealt much more directly with scheduling and logistical issues than the school-wide committees. For example, over 50 percent of the yearly committees were involved in setting course and examination schedules, reviewing the number of classroom hours and course credits, and responding to student grievances regarding schedules, tests, and logistics.

CURRICULUM TASKS

Table 2 shows the tasks that the school-wide curriculum committees undertook routinely. The respondents indicated that reviewing proposals for new courses or clerkships (86 percent) and setting general educational policy (79 percent) were the

TABLE 2

Percentages of School-Wide Curriculum Committees at 105 U.S. and Canadian Medical Schools That Performed Various Tasks Related To Curriculum Management and Evaluation, 1987*

Tasks	Percentages
Reviewing proposals for new courses and/or clerkships	86
Setting general educational policy for the school	79
Evaluating courses and/or clerkships	69
Determining appropriate course hours and course credits	54
Considering faculty grievances about curricular issues	53
Reviewing NBME scores	45
Conducting institutional self-study for accreditation	43
Setting course and examination schedules	37
Considering student grievances about the curriculum	37
Analyzing student performance	24

* Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16). A total of 109 schools responded, and 105 of them had school-wide curriculum committees.

two primary tasks of the school-wide curriculum committee. However, a large number of respondents ($n = 73$) also indicated that course evaluation was a primary committee task; 59 of these 73 schools reported that they had created a systematic procedure for formal review of the curriculum at regular intervals. In 28 of these schools, some form of curriculum review occurred annually. Of the 73 schools undertaking course review, 58 reported that directors of courses with identified deficiencies were expected to submit to the curriculum committee a formal reply, either in person or in writing, which addressed the cited problems. When the school-wide committee identified problems with a course and recommended changes, this information was also commonly sent to the department chairperson (56 of the 73 schools) and to the associate dean for academic affairs (46 of the 73 schools).

Data from the 59 schools reporting an established course review procedure indicated that multiple sources of information were commonly examined in this process. Table 3 depicts the frequency of use for various data sources for these 59 schools. Student ratings were employed almost universally by these schools (55 of 59). In contrast, alumni ratings and review by external consultants were used at only a small percentage of these 59 schools.

All respondents, whether or not they considered course review to be an appropriate committee task, were requested to indicate the activities which they felt the school-wide committee should undertake in the future. These responses are presented in Table 4. Three future tasks stood out: developing a systematic procedure for course review (32 percent), defining overall curriculum objectives (30 percent), and designating core curriculum material (29 percent). Very few respondents were interested in obtaining alumni evaluations of the curriculum (4 percent), becoming more involved in the mechan-

TABLE 3

Percentages of School-Wide Curriculum Committees at 59 U.S. and Canadian Medical Schools That Use Various Sources in Reviewing Courses, 1987*

Sources Used To Review Courses	Percent
Student ratings of courses	93
Self-assessment by course directors	68
Interviews with faculty members	66
Peer review of syllabus, tests, and lectures	63
Student performance in courses	63
Interviews with students	59
Student performance on NBME examinations	58
Analysis by external consultants	14
Alumni feedback	14
Comparisons with other schools	7

* Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16). A total of 109 medical schools responded, and 59 of them had a school-wide curriculum committee that had developed a procedure for systematic course review.

TABLE 4

Percentages of School-Wide Curriculum Committees at 105 U.S. and Canadian Medical Schools That Wish To Undertake Various Tasks in the Future, 1987*

Tasks	Percent
Develop course review system	32
Define overall curriculum objectives	30
Identify core curriculum material	29
Communicate curricular issues to faculty	19
Conduct regular course reviews	18
Obtain more input from faculty	15
Increase use of NBME scores in curriculum review	7
Increase involvement in course scheduling	5
Increase alumni input	4
Increase student input	1

* Questionnaires were sent to 144 medical schools in the United States (128) and Canada (16). A total of 109 schools responded, and 105 of them had school-wide curriculum committees.

ics of curriculum operation (5 percent) or obtaining broader faculty input into curricular decision-making (15 percent).

PERCEPTIONS OF IMPACT

Overall, 51 percent (53 of 105) of the respondents indicated that their school-wide curriculum committee had exerted a "significant" impact over the previous five years, with the remainder divided among "moderate," "minimal," and "no tangible" impact. Cross-tabulation of the questionnaire data revealed the following: (*a*) the impact of committees with an administrative orientation was more likely to be perceived as significant (20 of the 30 schools) than faculty-oriented committees (16 of 40) or committees with a balance between faculty and administrative influences (17 of 35); (*b*) the presence of an annual charge from the dean was correlated to perceptions of significant impact (91 percent of the school-

wide curriculum committees that received an annual charge from the dean were seen as having a significant impact versus 32 percent of those committees not routinely receiving such a charge); and (*c*) 66 percent of the school-wide curriculum committees rated as having a significant impact reported an established course review procedure whereas 44 percent of the committees rated as having lower impact reported having created such a procedure.

Of the 16 faculty-oriented committees perceived as exerting a significant impact, 14 reported use of a routine procedure for course review. Two of the 24 faculty-oriented committees rated as having lower impact reported the use of a course review procedure. In addition, 11 of the 20 administration-oriented committees that were rated as having a significant impact reported development of a course review procedure. Of the 10 administration-oriented committees that received lesser ratings of impact, two reported that a course review system had been implemented. Curriculum committees in the Canadian medical schools received a higher percentage of significant-impact ratings (9 of 12 schools; 75 percent) than medical schools in the United States (44 of 93 schools; 47 percent).

Discussion

Individuals who have served on curriculum committees for a number of years may be surprised by the results reported here. The often-expressed conventional wisdom about curriculum committees is that, more often than not, they are primarily arenas for interdepartmental fighting over classroom and laboratory hours in the preclinical years and the numbers of weeks allocated to each department for clerkships in the third and fourth years. Reid (16) discussed the obstacles likely to be encountered when faculty members or administrators attempt to move the curriculum committee beyond the focused interest of individual members to a broader view of the entire curriculum. Harden's (7) famous quotation, "It is more difficult to change a curriculum than to move a cemetery," aptly reflects the pessimism often heard at medical education meetings when the topic of curricular innovation is mentioned.

In contrast to these negative perspectives, the results reported here indicate that many medical school curriculum committees are seen as a positive influence. Although the questionnaire was limited in scope, some of the outcomes are enlightening and should serve as a foundation for further investigation. In accordance with the recommendations of curriculum specialists (5–7), more than 50 percent of the responding schools appear to have made a commitment to formal curriculum evaluation by developing review procedures that involve the analysis of data from several sources. The definition of what exactly constitutes a systematic course review procedure may vary, and a degree of subjectivity was undoubtedly present in the responses to these questions. But it was apparent that two essential components—establishing a regular evaluation cycle and collecting data that reflect several perspectives—were employed by the schools that said they had created such a system. The data suggest that many of these schools attempted to apply the review process in an active manner rather than taking a passive posture and waiting for problems to arise. Many of these committees were trying to maintain at least a degree of curricular accountability as evidenced by the number requiring a formal response from course directors when the committee pinpoints an education problem.

The data on use of course review procedures suggests that development of such a system is linked to perceptions of committee impact. Only 16 of the 40 faculty-oriented committees were rated as having a significant impact; but of these 16, 14 reported the use of course review procedure. Only two of 10 administration-oriented committees that received lesser impact ratings had developed a course review system. However, more than half of the 20 administration-oriented committees that were highly rated reported the development of a course review procedure.

Two-thirds of the respondents were administrators, and many probably had a significant involvement in the affairs of the school-wide curriculum committee. This fact cannot be overlooked when considering the results, especially since the committees with a pronounced administrative orientation tended to be rated higher than the faculty-oriented committees in having an impact. To check for potential bias on the part of the administrator respondents, the authors compared the response patterns of administrators and faculty members on a number of items, including the impact question. The results showed that the administrators were less optimistic about the value of their schools' curriculum committees than the faculty members. Most of the faculty members who received a questionnaire were curriculum committee chairmen, and they may also have had a built-in bias that skewed the ratings of significance upward. However, the fact that a number of committees of both types were judged to be of limited value suggests that the respondents were willing to be critical of their committee.

Analysis of the open-ended comments provided by the respondents to amplify their answers revealed four persistent themes. Many commented on the need to restructure the traditional departmentally based curriculum committee into a smaller or more task-oriented group. Three schemes were proposed: creation of an executive curriculum committee composed of a core group of six to seven individuals with a strong interest in curriculum planning and/or review; establishment of curriculum subcommittees for each curricular year of the program; and use of administratively appointed review committees that would periodically evaluate the teaching program independent of the curriculum committee.

A second theme that emerged from the open-ended responses was the desire to increase the involvement of course directors in overall planning. Since these individuals are the ones most affected in the educational program in terms of time, effort, and responsibility for student progress, it was argued that they should be the nucleus of the curriculum planning process rather than elected or appointed faculty members, who may have limited involvement in the undergraduate medical curriculum, particularly in regard to the third and fourth years. It is evident from the responses to questions about membership that many schools were considering this idea.

The third theme of the open-ended comments was expanding on the focus of the curriculum committee into the third and fourth years. Curriculum committees have traditionally concentrated on the preclinical years, since classroom courses lend themselves more easily to inspection (reading the syllabus) and quantification (counting the number of classroom hours) than the clinical rotations. The latter are sometimes perceived by basic science faculty members to be impervious to close scrutiny because of their lack of traditional classroom structure. The suc-

cess or failure of efforts to bring the clinical years under the scrutiny of a curriculum committee would be an inviting area for additional research.

Finally, the critical need for leadership in curricular matters was highlighted by many respondents. One of the most striking results of the study reported here was the very strong correlation between the perceptions of committee impact and a specific charge or assignment provided to the committee by the dean. Thirty-one of the 34 committees receiving an annual charge from the dean were considered to be very successful. It can be hypothesized that the dean's charge focuses energy on key problems and provides a schedule for action. Many of the respondents commented on the importance of these two attributes—key problems and a schedule—particularly when attempting to energize a committee that has played a passive role in curricular affairs so that it takes a more active posture. Twenty-six committees both received an assignment each year from the dean and employed an annual course review system examining a specific phase of the curriculum. Of these, all but three were considered to have significant impact. One interpretation is that the dean's charge provides committee members with a sense of purpose, while the course review system provides a built-in mechanism the committee can use to gather the information needed for thoughtful decision-making. If a high percentage of the membership of the committee is replaced annually and the chairperson rotates among members, having a charge from the dean and a protocol for conducting course reviews may provide the structure needed to ensure continuity.

There was a high degree of philosophical agreement that the main role of the curriculum committee should be to plan and monitor the broad scope of the instructional program. Only a few responders felt that the committee should be involved in the daily logistics of curriculum operation or serve merely as a forum for general discussion without involvement in planning or implementation. However, a number of the respondents suggested in open-ended responses that the dividing lines between developing, implementing, and monitoring curriculum policy had become hazy in their schools, a situation which contributed to confusion about the committee's role.

Virtually all of the school-wide curriculum committees had administrators as either official or ex-officio members. However, the number of administrators on these committees varied widely: ranging from committees that had a few administrative personnel participating as ex-officio observers to committees that were primarily composed of deans, department chairpersons, and the directors of various academic support services such as the registrar's office and the library. In terms of organizational issues, the varied number and role of administrators on curriculum committees was the most striking finding. Because of their committee membership and their process for selecting a chairperson, 40 of the responding schools evidently perceived the curriculum committee to be a faculty responsibility, while 30 schools had committees that appeared to be an administrative arm of the dean's office. It was interesting to note that a higher percentage of the new medical schools had faculty-oriented committees than did the schools created before 1967. While the data suggest that either organizational format (administration-oriented or faculty-oriented) can produce a committee perceived as having significant impact, the administratively oriented committee may

find its task easier. The task may be easier because an administratively oriented committee has the ability to combine policy-making and implementation, while a faculty-oriented committee may need to rely on other groups and individuals to convert its policies into action and then make sure that they are implemented as planned.

In regard to the functions of curriculum committees, the respondents were clearly not interested in obtaining more input from alumni or from external consultants such as HMO leaders. This attitude was surprising in light of the uncertainty and changes in many parts of the health care system. Alumni who deal with these changes firsthand may be able to provide guidance that would enhance program relevancy. A recent study by Jacobs and Mott (3) demonstrated that HMO administrators have definite opinions about the skills that should be emphasized in medical school and residency training. Their survey of 168 HMO medical directors revealed that cost-effective use of diagnostic and treatment services, skills in utilization review and quality assurance, adaptability to change, bedside manner, comfort with a team concept, and clinical experience in an ambulatory setting were high priorities when recruiting physicians. Clinical experience in an inpatient setting was considered to be of relatively low priority. Additionally, their survey indicated that the HMO leaders' concerns about medical education were strikingly similar to some of the issues raised in the GPEP report: the curriculum should direct more attention to environmental and life-style factors, the problems of poverty and malnutrition, coping with ethical dilemmas, and the need for physicians to learn how to use community health services.

The respondents in the present study also had little interest in increasing student involvement or obtaining greater input from faculty members. These findings were equally true for committees that seemed to take active roles in curriculum evaluation and revision and for committees that did not consider curriculum evaluation to be their responsibility. Apparently, curriculum committees of all types felt they had adequate input and would rather focus their energies on other tasks than on gathering faculty and/or student input. For example, 34 of the 46 schools that did not routinely employ a course review system reported that they would like to create one. Defining overall curriculum objectives, identifying core content, or both were mentioned as desired functions of a curriculum committee by over 50 percent of the responding schools. This finding indicates that these curriculum planning tasks have not been undertaken at many schools but are still seen as priority items by curriculum managers.

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